U.S. Department of Energy
Office of River Protection
P.O. Box 450
Richland, Washington 99352

01-OSR-0491

Mr. Ron F. Naventi, Project Manager
Bechtel National, Inc.
3000 George Washington Way
Richland, Washington 99352

Dear Mr. Naventi:

CONTRACT NO. DE-AC27-01RV14136 – CONTAMINATION MONITORING AND CONTROL INSPECTION REPORT, IR-01-007

This letter provides Inspection Report, IR-01-007, that documents the Office of Safety Regulation's (OSR) September 21 through November 6, 2001, inspection of the Bechtel National, Inc. (BNI) implementation of its radiological contamination monitoring and control program. The inspectors identified no Findings.

OSR inspectors found the following: BNI had developed and effectively implemented procedures for its radiological contamination monitoring and control program; BNI survey teams followed established procedures; BNI had implemented adequate contamination control procedures that included appropriate administrative controls for radioactive contamination; the BNI monitoring instrumentation subcontractor, Pacific Northwest National Laboratory, implemented an effective monitoring program; and the BNI records program adequately supported the contamination monitoring and control program. The OSR inspectors did not assess implementation of the contamination control because, to date, no site contamination had been identified.

If you have any comments concerning the inspection report, you or your staff may contact me or Pat Carier of my staff, (509) 376-3574. Nothing in this letter should be construed as changing the Contract, DE-AC27-01RV14136. If, in my capacity as the Safety Regulation Official, I provide any direction that your company believes exceeds my authority or constitutes a change to the Contract, you will immediately notify the Contracting Officer and request clarification prior to complying with the direction.

Sincerely,

Robert C. Barr
Safety Regulation Official
Office of Safety Regulation

OSR:JLP

Enclosure

Enclosure
01-OSR-0491

U.S. DEPARTMENT OF ENERGY
Office of River Protection
Office of Safety Regulation

INSPECTION: CONTAMINATION MONITORING AND CONTROL INSPECTION

REPORT NO.: IR-01-007

FACILITY: Bechtel National, Inc.

LOCATION: 3000 George Washington Way
Richland, Washington 99352

DATES: September 21 - November 6, 2001

INSPECTORS: W. Pasciak (Lead), Senior Regulatory Technical Advisor
J. Polehn (Deputy Lead), Senior Regulatory Technical Advisor

APPROVED BY: P. Carier, Verification and Confirmation Official
Office of Safety Regulation

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EXECUTIVE SUMMARY
Contamination Monitoring and Control Inspection
Inspection Report Number IR-01-007

INTRODUCTION

This inspection of the contamination monitoring and control programs of Bechtel National, Inc. (the Contractor) covered the following specific areas:

- Adequacy of Contamination Monitoring Procedures. (Section 1.2)
- Implementation of Contamination Monitoring Program and Adequacy of Instrumentation Control Program. (Section 1.3)
- Adequacy and Effectiveness of Administrative Controls for Control of Radioactive Contamination. (Section 1.4)
- Adequacy and Effectiveness of Records. (Section 1.5)

SIGNIFICANT OBSERVATIONS AND CONCLUSIONS

- The Contractor had developed adequate procedures for its radiological contamination monitoring program. (Section 1.2)
- The Contractor's survey team followed established procedures and its instrumentation subcontractor, Pacific Northwest National Laboratory, implemented an effective monitoring instrumentation program. (Section 1.3)
- The Contractor had implemented adequate contamination control procedures that included appropriate administrative controls for radioactive contamination. (Section 1.4)
- The Contractor's records program adequately supported the contamination monitoring and control program. (Section 1.5)

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CONTAMINATION MONITORING AND CONTROL INSPECTION

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CONTAMINATION MONITORING AND CONTROL INSPECTION

1.0 REPORT DETAILS

1.1 Introduction

In accordance with the River Protection Project Waste Treatment Plant (RPP-WTP) Contract,[1] the U.S. Department of Energy (DOE), Office of River Protection, Office of Safety Regulation (OSR) performed an inspection of Bechtel National, Inc.'s (the Contractor) radiological contamination monitoring and control program.

The Contractor's commitments towards this program are described in the following DOE-approved documents:

- Radiation Protection Program (RPP)
- Integrated Safety Management Plan (ISMP)
- Quality Assurance Manual (QAM)
- Safety Requirements Document (SRD)
- Limited Construction Authorization Request (LCAR).

The purpose of this inspection was to verify the Contractor's implementation of these commitments. More specific implementing details are provided in the Contractor's Waste Treatment Plant Radiological Control Manual (WTPRCM).

1.2 Adequacy of Contamination Monitoring Procedures (Inspection Technical Procedure [ITP] I-145)

1.2.1 Inspection Scope

The inspectors verified that the Contractor had prepared, reviewed, and approved procedures describing administrative controls and work processes for performing radiological contamination monitoring activities during limited construction. The inspectors verified that their procedures complied with the RPP and other authorization basis (AB) documents such as the LCAR, ISMP, QAM, and SRD. The inspectors reviewed the programs and procedures for the contamination monitoring program. Specifically, the inspectors examined the Contractor's procedures associated with planning, scheduling and performing monitoring activities.

1.2.2 Observations and Assessments

The inspectors reviewed the Contractor's contamination monitoring procedures to verify they met AB requirements and had detail appropriate for describing administrative controls and work processes for performing contamination monitoring activities during limited construction.

[1] Contract No. DE-AC27-01RV14136 between the U.S. Department of Energy and Bechtel National, Inc., Section E.1, dated December 11, 2000.

To perform the verification, the inspectors reviewed the following Contractor procedures and documents:

- RPP-WTP-G-001, *Radiological Control Scheduled Radiation Survey Task Description,* Task No. Q-WTP-001, Revision 0, September 17, 2001
- RPP-WTP-G-001, *Radiological Control Scheduled Radiation Survey Task Description,* Task No. Q-WTP-002, Revision 0, September 17, 2001
- RPP-WTP-G-001, *Radiological Control Scheduled Radiation Survey Task Description,* Task No. V-WTP-002, Revision 0, September 17, 2001
- RPP-WTP-G-001, *Radiological Control Scheduled Radiation Survey Task Description,* Task No. V-WTP-003, Revision 0, September 17, 2001
- K72P523, *Required Radiological Surveillance,* Revision 0, June 21, 2001
- 24590-WTP-MN-ESH-01-001, *Waste Treatment Plant Radiological Control Manual,* Revision 0, August 14, 2001
- 24590-WTP-PL-NS-01-001, *Radiological Control Program,* Revision 0, August 16, 2001
- K72P524, *Performance and Documentation of Radiological Surveys,* Revision 0, June 21, 2001
- K72P525, *Contaminated Wildlife or Vegetation,* Revision 0, June 21, 2001
- K72P528, *Evaluation of Soil Contamination Areas,* Revision 0, June 21, 2001
- K72P536, *Contamination Area Controls*, Revision 0, June 21, 2001
- K72P531, *Radiological Posting*, Revision 0, June 21, 2001
- K72P527, *Release Surveys for Tools, Material and Equipment*, Revision 0, June 21, 2001
- 24590-WTP-RSR-RAD-01-1, *Radiological Survey Report,* September 25, 2001
- 24590-WTP-RSR-RAD-01-2, *Radiological Survey Report,* September 26, 2001.

The LCAR, Section 4, "Radiological Safety," specified the contamination monitoring requirements during limited construction. The inspectors reviewed the procedures listed above and verified they appropriately specified the LCAR contamination monitoring requirements such as monitoring frequency, action levels that would trigger mitigative actions, controls on radioactive contamination encountered, and record development, maintenance, storage, and retention. The inspectors identified no procedure deficiencies with regard to LCAR requirements.

The inspectors reviewed the procedures listed above related to the contamination monitoring and control requirements of the RPP. RPP Requirement 22 required that written procedures be developed. The WTPRCM provided implementation guidance for the RPP. The procedures contained the specific requirements of the RPP as well as implementation guidance contained in the WTPRCM. The inspectors determined that several of the procedures listed above, including *Required Radiological Surveillance* procedure and *Scheduled Radiation Survey Task Description* documents, addressed frequency, planning, and scheduling of monitoring in a manner consistent with the RPP and the WTPRCM. Where appropriate, the procedures provided operational flexibility. For example, in the area of frequency, the procedures provided the minimum required monitoring frequency for the project to be only quarterly because no elevated levels of radioactive contamination above background had been detected on the WTP site to date, but the procedures also provided for modification of the frequency based on whether changed conditions had occurred at the site, such as after high winds that brought potentially contaminated tumbleweeds onsite or resulting from major excavation work. The inspectors determined the reviewed documents fulfilled the procedural requirement part of RPP Requirement 22 for the contamination monitoring program. The inspectors identified no deficiencies in the reviewed procedures.

WTPRCM, Chapter 5, Part 5, also specified monitoring activities to be included in the radiological monitoring program. Procedures for field monitoring implementation such as *Radiological Control Scheduled Radiation Survey Task Description* documents, the *Performance and Documentation of Radiological Surveys,* the *Contaminated Wildlife or Vegetation,* and the *Evaluation of Soil Contamination Areas* appropriately implemented the WTPRCM specified activities. The procedures appropriately identified locations for monitoring, required monitoring instrumentation, specified action levels, notification actions if action levels were exceeded, and special circumstances (i.e., industrial safety and industrial hygiene concerns). The inspectors identified no deficiencies in the reviewed procedures.

The QAM, Policy Q-05.1, required that quality affecting activities such as contamination monitoring be performed in accordance with instructions, procedures, and drawings of the type appropriate to the circumstances. Specific procedural requirements are not identified in the QAM. The inspectors found the Contractor had appropriate instructions and procedures and those procedures had been reviewed, approved, and controlled according to the QAM (Policy Q-06.1). The inspectors identified no deficiencies.

In addition to reviewing the Contractor's program against the requirements of the LCAR, RPP, WTPRCM, and QAM, the applicable requirements of the SRD (Section 5.0, "Radiation Protection") and ISMP (Section 2.3, "Compliance with 10 CFR 835, "Occupational Radiation Protection") were reviewed. The SRD and ISMP for this area specified that an RPP compliant with 10 CFR 835 would be developed and submitted to DOE for approval. The inspectors concluded that the RPP was compliant with 10 CFR 835 in the area of contamination monitoring and control. No deficiencies were identified with regard to the Contractor's procedures and the SRD and ISMP.

1.2.3 Conclusions

The inspectors found the Contractor's radiological contamination monitoring procedures adequately identified measures to plan, schedule, and perform contamination monitoring and met the associated requirements in the AB.

1.3 Implementation of Contamination Monitoring and Adequacy of Instrumentation Control Program (ITP I-145)

1.3.1 Inspection Scope

The inspectors verified the Contractor had effectively implemented the approved procedures describing administrative controls and work processes for performing radiological contamination monitoring activities during limited construction and met the requirements of the RPP. The inspectors observed contamination monitoring activities, interviewed personnel responsible for these activities, and reviewed records generated from the monitoring activities. Also, the inspectors verified implementation of the Pacific Northwest National Laboratory's (subcontractor's) monitoring instrumentation program through interviews with the subcontractor staff and review of procedures and records.

1.3.2 Observations and Assessments

To review the implementation of the approved procedures describing administrative controls and work processes for performing radiological monitoring activities during limited construction, the inspectors observed monitoring activities in the field including records generated from the monitoring activity. Since the Contractor utilized a subcontractor to provide radiological monitoring instrumentation, the inspectors also reviewed the following subcontractor's procedures and documents:

- *Technical Basis Document for Radiation Detection Instruments*, August 23, 2001
- *Bicron Surveyor X/Portable Alpha Monitor Data Sheet*, *Radiological Calibration Procedures,* Manual MA-563, S/N B8681C, August 1, 2001
- *Pancake Probe Calibration Data Sheet, Radiological Calibration Procedures,* Manual MA-563, Procedure 3.7.0, August 3, 2001
- *GM Pancake Probe Calibration Procedure, Radiological Calibration Procedures,* Manual-563, Procedure 3.9.2, January 26, 2000
- *GM Count Rate Meter Calibration Procedure,* PNL-MA-563, September 15, 2000
- *Bicron Surveyor X/Portable Alpha Monitor Calibration Procedure, Radiological Calibration Procedures,* Manual MA-563, Procedure 3.10.2, November 21, 2000

- *Eberline GM Count Rate Instrument Data Sheet,* S/N 259, Bar Code CMEB5-0014, August 7, 2001

- *Eberline GM Count Rate Instrument Data Sheet,* S/N 313, Bar Code CMEBB-0109, August 7, 2001.

During the inspection, the inspectors observed one contamination monitoring activity. From interviews with the Contractor's Radiological Control Technicians and management, the inspectors found the staff to be knowledgeable of the procedures and task descriptions. The staff was aware of appropriate instruments to use during monitoring, how to monitor for radiological contamination, appropriate locations at which to monitor, and records that needed to be generated from the monitoring activities. The inspectors observed the Contractor staff adequately performed the contamination monitoring activities identified in their procedures, *Contaminated Wildlife or Vegetation*, *Evaluation of Soil Contamination Areas*, and task descriptions listed in Section 1.2.2. The staff used Geiger-Muller (GM) detectors for beta/gamma radiation and portable alpha monitors for alpha radiation. These instruments were appropriate for the surveys performed. The inspectors observed that locations likely to have contamination were the primary focus and such locations were scanned at the appropriate distances and speeds. In addition, the survey instruments that were used had up-to-date calibration stickers. The data collected during these surveys were documented in the *Radiological Survey Report* documents listed in Section 1.2.2. The reports were found to present the contamination monitoring data in a legible and complete manner and followed procedures for content. The inspectors found that the Contractor's implementation of the contamination monitoring program met RPP requirements. No deficiencies were identified in this area.

The Contractor used the subcontractor to provide instrumentation service (BNI letter CCN 022808, to Pacific Northwest National Laboratory, dated September 24, 2001). The letter stated that the Contractor's Quality Assurance organization had performed an audit of the subcontractor. The letter stated the subcontractor would be placed on the Contractor's Approved Supplier List with the restriction that the Contractor would perform a limited scope audit early in the monitoring process to verify corrective action of the two Contractor identified items that addressed formal establishment of individual training requirements and update of matrix references. The Contractor staff obtained the monitoring instruments from the subcontractor prior to performing the surveys and returned the instruments at the end of each day. The inspectors observed the subcontractor had appropriate control of the radiological monitoring instruments. The subcontractor also had an appropriate technical basis document for selecting the instruments as described in the RPP (Requirement 44) that ensured that the instruments used were appropriate for the types, levels, and energies of radiation encountered. The inspectors did not observe calibration of the instruments; that activity will be observed in a future inspection.

The inspectors reviewed the above calibration procedures for the different monitoring instrumentation. The inspectors found the calibration procedures were appropriate for the instruments. For example, the GM Pancake Probe calibration procedure contained specific directions for preliminary checks and inspections, radiological calibrations, and the expected response of the instrument. The subcontractor had appropriate documentation showing calibration of the instruments by qualified staff. The records, generated for choice of instruments and instrument calibration, were legible, complete, and followed procedures. No deficiencies were identified in the subcontractor's instrumentation control program.

1.3.3 Conclusions

The inspectors found the Contractor's radiological contamination monitoring procedures and task descriptions were effectively implemented in the one activity observed. Also, the instrumentation subcontractor's monitoring instrumentation program was appropriately established and implemented.

1.4 Adequacy and Effectiveness of Administrative Controls for Control of Radioactive Contamination (ITP I-145)

1.4.1 Inspection Scope

The inspectors assessed the adequacy of the Contractor's administrative controls for control of radioactive contamination. To perform this assessment, the inspectors reviewed programs and procedures and interviewed line management and staff.

1.4.2 Observations and Assessments

The inspectors reviewed the following Contractor programs and procedures:

- 24590-WTP-PL-NS-01-001, *Radiological Control Program,* Revision 0, August 16, 2001
- K72P536, *Contamination Area Controls*, Revision 0, June 21, 2001
- K72P531, *Radiological Posting,* Revision 0, June 21, 2001.

The inspectors found the *Radiological Control Program* (RCP), an implementing document for the RPP, specified procedures that contained directions appropriate for controlling radioactive contamination. These procedures implemented the DOE approved RPP for contamination control. RPP Requirements 114 through 121 addressed the specifics for control of radioactive contamination. Requirement 114 through 116 described limiting the release of material and equipment if the surface contamination exceeded specific limits. Requirements 117 through 119 addressed control of areas to prevent removal of contamination from radiological areas. Requirements 120 and 121 specified controls for individuals entering and exiting contamination areas. The WTPRCM provided implementation details for all of these RPP requirements. The procedures reviewed adequately specified the measures to implement these RPP requirements because they contained the detail for controlling contamination identified in the WTPRCM. For example, the *Contamination Area Controls* procedure addressed appropriate steps required to establish, control, and down post Contamination Areas. The procedure also appropriately specified the measures for set up of contamination areas and entry and exit of those areas. The *Radiological Posting* procedure appropriately specified protective clothing use. The *Release Surveys for Tools, Material and Equipment* procedure contained appropriate limits at which contamination control became necessary for release of material and equipment and specified appropriate monitoring techniques. No deficiencies were identified in the procedures that were reviewed and they adequately addressed requirements of the RPP and the WTPRCM. In

addition, the line management and staff interviewed were knowledgeable of the program and procedure requirements and methodologies for controlling contamination. The inspectors identified no deficiencies in the Contractor's administrative controls for controlling radioactive contamination.

The procedures and implementation of the following contamination control requirements of the RPP were not reviewed during the inspection: RPP Requirements 54 (monitoring of packages), 56 (contamination control), 69 and 70 (posting of contamination), 107 (as low as reasonably achievable (ALARA) during design), 113 (implementation of ALARA to reduce exposure), and 124 through 127 (sealed source control). Implementation of RPP Requirements 114 through 121 (radioactive contamination control) were not observed.

1.4.3 Conclusions

From review of Contractor program documents and procedures, the inspectors concluded the Contractor had an adequate program for control of radioactive contamination. The inspectors did not assess implementation of the Contractor's administrative controls for this program because Contractor WTP site surveys had not identified any contamination.

1.5 Adequacy and Effectiveness of Records (ITP I-145)

1.5.1 Inspection Scope

The inspectors assessed the Contractor’s procedures and process for development, maintenance, review, and control of records for radiological contamination monitoring and control activities. The inspectors also interviewed line management and staff.

1.5.2 Observations and Assessments

To assess the Contractor's procedures and process for development, maintenance, review, and control of records for contamination monitoring and control activities, the inspectors reviewed the following Contractor procedures and records:

- K72P528, *Evaluation of Soil Contamination Areas,* Revision 0, June 21, 2001
- K72P524, *Performance and Documentation of Radiological Surveys,* Revision 0, June 21, 2001
- K72P525, *Contaminated Wildlife or Vegetation,* Revision 0, June 21, 2001
- 24590-WTP-RSR-RAD-01-1, *Radiological Survey Report,* September 25, 2001
- 24590-WTP-RSR-RAD-01-2, *Radiological Survey Report,* September 26, 2001

- 24590-WTP-MN-ESH-01-001, *Waste Treatment Plant Radiological Control Manual,* Revision 0, August 14, 2001.

As described below, the inspectors found RPP Requirement 86 (documentation of result of monitoring) was appropriately implemented and no deficiencies were identified. The inspectors found the procedures appropriately specified requirements for radiological contamination monitoring record development, maintenance, review, and control. The procedures met the requirements of the RPP (Requirement 86) to document and maintain the results of monitoring activities. Also, *Performance and Documentation of Radiological Surveys* procedure met the requirements of the WTPRCM (Articles 751 and 752) to record specific information such as results, date, time, purpose, and location of the survey as well as instrument information. From review of the results of the contamination monitoring contained in the two *Radiological Survey Reports*, dated September 25 and 26, 2001, the inspector determined the records met the requirements of the RPP. The records also provided appropriate information, as required by the WTPRCM. The records were legible, accurate, and complete. Because no contamination had been found during the Contractor's radiological survey of the WTP Site, the inspectors could not review records for control of contamination. From discussions with the Radiological Control Technicians and the Lead Radiological Safety Engineer, the inspector determined they were knowledgeable of procedures for development, review, maintenance, and control of the radiological contamination monitoring and control records, and understood the appropriate forms needed to be completed, and the data and review needed. The inspectors found no deficiencies in this area.

RPP Requirements 88 (portion of requirement that has to do with documentation of results of monitoring for release of equipment), 91 (documentation of ALARA considerations during design), and 92 (documentation of results of internal audits), 93 (written declarations of pregnancy), 94 (changes in equipment used for monitoring), 95 (records for sealed radioactive source control) were not evaluated during this inspection because no contamination was found during monitoring of the site that could be controlled or the RPP Requirement was not utilized because of the stage of the WTP project (i.e., early design and construction on a clean site).

1.5.3 Conclusions

The inspectors concluded the Contractor’s procedures and process for development, maintenance, review, and control of records for the contamination monitoring and control program were adequate and implementation of the procedures and process, as applicable, was adequate. The procedures and records reviewed met the requirements of the RPP.

2.0 EXIT MEETING SUMMARY

The inspectors presented preliminary inspection results to members of Contractor management at an exit meeting on November 6, 2001. The Contractor acknowledged the observations and conclusions.

Subsequent to the exit meeting, the inspectors asked the Contractor whether any materials examined during the inspection should be considered limited rights data. The Contractor stated that no limited rights data were examined during the inspection.

3.0 REPORT BACKGROUND INFORMATION

3.1 Partial List of Persons Contacted

M. Platt, BNI, Safety Program Lead
E. Smith, BNI, Safety Program Engineer
R. Buckner, BNI, Radiological Safety Engineer/Senior Radiological Control Technician
S. Henry, BNI, Lead Radiological Safety Engineer
L. Nelson, BNI, Radiological Safety Engineer/Senior Radiological Control Technician
M. Perks, BNI, Radiological & Fire Safety Manager
M. Johnson, PNNL, Manager, Instrumentation Services and Technology

3.2 List of Inspection Procedures Used

Inspection Administrative Procedure A-105, "Inspection Performance"

Inspection Technical Procedure I-145, "Contamination Monitoring and Control Assessment"

3.3 List of Items Opened, Closed, and Discussed

Opened

None.

Closed

None.

Discussed

None.

3.4 List of Acronyms

AB	authorization basis
ALARA	as low as reasonably achievable
BNI	Bechtel National, Inc.
CCN	Correspondence Control Number
CFR	Code of Federal Regulations

DOE	U.S. Department of Energy
GM	Geiger-Muller
LCAR	Limited Construction Authorization Request
ISMP	Integrated Safety Management Plan
ITP	Inspection Technical Procedure
OSR	Office of Safety Regulation
PNNL	Pacific Northwest National Laboratory
QAM	Quality Assurance Manual
RPP	Radiation Protection Program
RCP	Radiological Controls Program
RPP-WTP	River Protection Project – Waste Treatment Plant
SRD	Safety Requirements Document
WTPRCM	Waste Treatment Plant Radiological Control Manual